


1.6 Written Reports to reveal Clarity of Imagination, Insight, and Ingenuity

1.6.1 Reporting with Light to achieve a high quality of writing Style

In writing a Photonics Scientific Report:-

- 1 Leave a slightly **Wider Margin at the Left Side on ALL pages** – to allow for Binding requirements.
- 2 For good looks, the **first word of each Paragraph should be ONE Tabulation Space Indented**. This is not the “modern style, but the “old style” indentation looks far better in any written Text.
- 3 As a sample of Font Size, this is **Calibri 10**, used in these Documents for written space saving reasons.
 - 3.1 For Chapter Headings / Sub-Headings, **Calibri 14 Bold is very acceptable**.
 - 3.2 For Main Text, **Calibri 12 is very acceptable** – or a comparable Font Size.
 - 3.3 For Titles / Labels on Diagrams, Plates, etc., **Calibri 10** is very acceptable – or **Calibri 8** in some instances.
 - 3.4 Other Fonts, of similar proportions, are available, but should possess **similar size of Font Characters**.
 - 3.5 Seek to create a Report Presentation with possesses some **personal individual, and high quality, Style**.
- 4 Ensure that the entire Report is **Justified on the Left and Right Margins**.
- 5 Such Scientific Reports, which are to be submitted for moderation by a Supervisor, are normally written with a **Line Spacing of 1.5** (as shown here), rather than the more usual Single Line Spacing, (with Double Line Spacing being recommended in some instructions, or Single Line Spacing in some instruction - to save paper).
- 6 When using Line Spacing of 1.5, always **leave a Double 1.5 Line Spacing** between each Paragraph.
- 7 Each Page of a Scientific Report needs to be carefully designed, with attractive appearance being a key factor:-
 - 7.1 **Start** each Chapter on a **Fresh Page**.
 - 7.2 Always place at least **one sentence at the top of each Page**, and **at the bottom of each Page** so as to “**frame**” the Page – i.e. not a Diagram, or a Photograph, directly at the top or bottom of a Page.
 - 7.3 Always seek to **intersperse the written Text** regularly with **Figures, Circuit Diagrams, or Photographs**.

1.6.2 Reporting with Light – Front Cover Style

2.1 Project Title	A Fibre Optic Laser Speckle Vibration Sensor
2.2 Project Acronym + Logo	S T A R Speckle Tension Activation Release 
2.3 Laboratory Base	Louis Speckle (Senior) Photonics Academy of Wales @ Bangor
2.4 Declaration Statement	This Laser Photonics Report is submitted in fulfilment of the requirements for the Photonics Module 1 at Level 4.
2.5 Project Completion Date	June 2014

2.6 Do NOT Insert a Footnote Number on this Cover Sheet

1.6.3 Reporting with Light – Formal Statements Style

3.1 Statement of Originality

The work presented in this dissertation is entirely from the studies of the individual student, except where otherwise stated. Where derivations are presented and the origin of the work is either wholly or in part from other sources, then full reference is given to the original author. This work has not been presented previously for any degree, nor is it at present under consideration by any other degree awarding body.

.....

3.2 Statement of Availability

I hereby acknowledge the availability of any part of this dissertation for viewing, photocopying or incorporation into future studies, providing that full reference is given to the origins of any information contained herein.

.....

1.6.4 Reporting with Light – Abstract Style

4.1 The **Project Abstract** is normally limited to circa **250 Words**.

4.2 The **Project Abstract** should consist of **3 Paragraphs**, clearly and concisely stating:-

4.2.1 The **Purpose** of the Project and the Intended Outcome.

4.2.2 The **Photonics Concepts and Approach** adopted towards achieving the Project and Intended Outcome.

4.2.3 Whether or not the **Intended Outcome has been achieved**.

1.6.5 Reporting with Light – Acknowledgement Style

5.1 The **Project Acknowledgement Page** should include a reference to:-

5.1.1 Any **Members of Staff** who specifically have assisted in the development of the Project achievements.

5.1.2 Anyone who has provided “**Teamwork**” assistance and / or practical assistance in any form, including any of the Colleagues who may well have provided some enabling assistance at various stages.

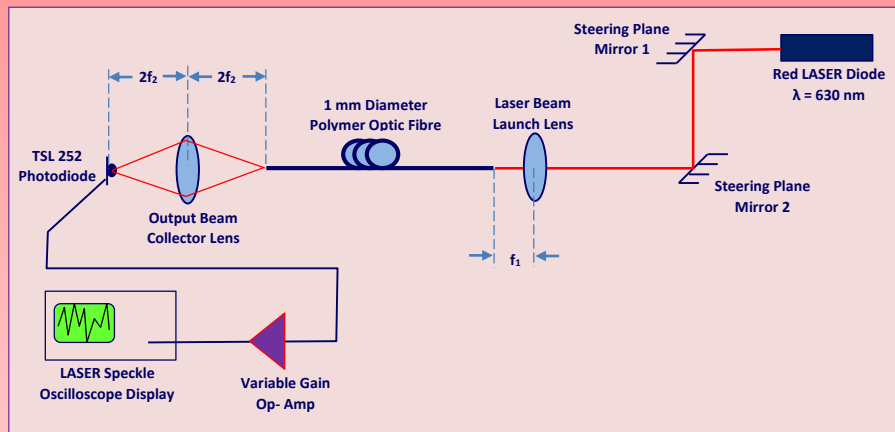
5.2 The **Acknowledgements** page should be a very serious section of your scientific Report, and should not involve any superficial insertions, which are in bad style.

1.6.6 Reporting with Light – Contents / Index Style

Contents	Page
Cover Page	i
Bangor University Originality and Availability Statements	i
Abstract	ii
Acknowledgements	iii
Contents	iv
Figures	v
Tables	vi
Plates	vii
Chapter	
1 Introduction	
1.1 Prototype Design Purpose	1
1.2 Analysis of Already Available Designs	2
1.3 Analytical Reasoning behind Proposed Prototype Design	3
1.4 Implications of Proposed Prototype Design	4
2 Photonics Concepts Considered for this Project	
2.1 The Importance of Photonics Concepts in the 21 st Century	5
2.1.1 Intensity	6
2.1.2 Wavelength	7
2.1.3 Phase	7
2.1.4 Coherence	8
2.1.5 Polarization	8
2.1.6 Pulse Modulation	9
2.1.7 Optical Fibre	10
2.1.8 Protraction	10
2.2 Historical Background of Photonics Concepts and Personalities	11
2.3 Significance of availability of the Photonics Concepts for this Project	11
3 Photonics Concept Laboratory Observations	
3.1 Specific Optical Signal Sensor Analysis	12
3.2 Specific Optical Signal Source Analysis	13
3.3 Specific Attenuation of Signal to Sensor Analysis	14
4 Photonics Concept Laboratory Investigations	
4.1 Empirical Investigations Performed	15
4.2 Empirical Observations from Investigations Performed	16
4.3 Empirical Optoelectronics Prototype Circuits employed	17
4.4 Empirical Measurements Obtained	20
4.5 Empirical Results Tabulated	22
4.6 Empirical Evidence Outcomes	24
4.7 Empirical Evidence Implications	26
5 Prototype Design Specification	
5.1 Design Specification Idea Mark 1 – with Further Investigations	28
5.2 Design Specification Idea Mark 2 – with Further Investigations	30
5.3 Design Specification Idea Mark 3 – with Further Investigations	32
6 Prototype Design Construction	
6.1 Optoelectronics Circuits Design and Test Procedures	34
6.2 Logic Control Brain Design and Test Procedures	36
6.3 Structural Engineering Design and Construction	38
7 Prototype Design Performance	
7.1 Final Completion Test Procedures	40
7.2 Completion Test Based Modifications	42
7.3 Prototype Design Performance Specification	44
8 Conclusions	
8.1 Actual Prototype Design Performance Achievements	46
8.2 Implications of the Design Performance Achievements	48
8.2.1 Financial Costing	50
8.2.2 Commercial Viability Considerations	52
8.2.3 IP Potential	54
8.3 Further Development and Additional Application Potential	55
9 Reference Bibliography	
9.1 Scientific Journals	56
9.2 Scientific Literature	57
9.3 Electronic Communications	57
9.4 Unpublished Communications	58
10 Appendix A Additional Circuit Diagrams	59
Appendix B Data Sheets	59
Appendix C Technical Information	60
11 Finale Rear Sheet (Just Blank)	

1.6.7 Reporting with Light – Scientific Diagrams / Figures Style

- 7.1 Centralize Diagram / Photograph / Table with respect to Page centre.
- 7.2 Label as *Figure 1.2* or *Figure 2.2.3* – **Italics** separates *Figure 1.2* from the actual Title Label - in Font Size 8.
- 7.3 After *Figure 2.2.3*, insert **Title Label (on the same line)** for the **Figure / Plate / Table** - perhaps in **Font Size 8 Bold**.
- 7.4 Try to insert “Talking Labels” on all diagrams - **Calibri Font Size 6 / 8**. Try to avoid using “Arrow Labels”.



- 7.5 All diagrams will require **Dimensions**, and **Measurements Recorded** – make the Labels “TALK”
- 7.6 All diagrams should indicate the precise **Orientation** information - **Plan / Side / Front Elevation**.
- 7.7 Consider some shading effects to the diagram box, to add some personal style to the Figure ? ? ?
- 7.8 In the Text, Refer to **Figure 7**, but on the Diagram, insert *Figure 7*.
- 7.9 Always insert a **BORDER** to any Diagram, or Circuit Diagram, to focus attention on to the Diagram.

1.6.8 Reporting with Light – Scientific Tabulated Results Style

Mirror Rotation	Wavelength of LASER Beam	Length of Aluminium Angle	Breadth of Aluminium Angle	Height of LASER beam
$\theta / ^\circ$	λ / nm	x / mm	y / mm	h / mm
Tolerance $\pm 2^\circ$	Tolerance $\pm 0.2\text{nm}$	Tolerance $\pm 1 \text{mm}$	Tolerance $\pm 1 \text{mm}$	Tolerance $\pm 0.5 \text{mm}$
44	632.8	77	23	105.0
46	632.8	78	24	105.5
etc	etc	etc	etc	etc

Table 1.1 Empirical measurements obtained from Figure 3.2.5

	Higher Frequency Group			
Lower Frequency Group	f_{5-8} / Hz			
f_{1-4} / Hz	$\pm 5 \text{Hz}$			
$\pm 5 \text{Hz}$	1209	1336	1477	1633
697	1	2	3	A
770	4	5	6	B
852	7	8	9	C
941	*	0	#	D

Table 1.2 Dual Tone Multi-frequency Signal Values

1.6.9 Reporting with Light – Scientific Photographs Style

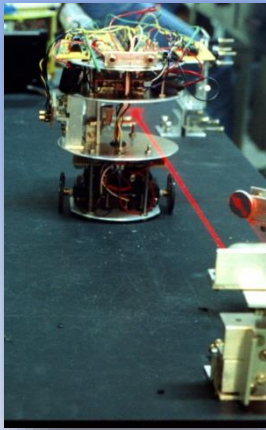


Plate 1.6.9.1 Front Elevation of the original
Photonics Academy Laser Beam Guided Mobile Robot



Plate 1.6.9.2 Photonics Academy of Wales @ Bangor
Fibre Optic Laser Speckle Robotic Hand + Mobile Robots

1.6.10 Reporting with Light – Scientific Reference / Bibliography Style

10.1	de Broglie Einstein, A Faraday, M Millikan, R Planck, M Thomson, J J	1923	Photons Interact with Electrons	Physics Review (A 35)	1245 - 1253
10.2	Herapath, D Land, E Tyndall, J	1936	Polarization in Optical Fibres	Applied Optics (27)	2367 - 2372
10.3	Dozy, A Lionheart, T	1999	The Aerodynamics of Photons	Longman Group	367 - 369
10.4	Photonics Amazing	1996	Wind Tunnel Testing of Photons	August	45 - 52
10.5	Yue, I C	2002	Photons with a Future	Bat Books Inc	Chapter 13
10.6	Helium-Neon	2014	Laser Photonics Tutorial Notes	Photonics Academy of Wales @ Bangor	1 - 101
10.7	www.xyz.com	2014	One can achieve anything - with a Laser	Laser Photonics Search	3 - 6

Reference Bibliography Footnotes - Keep all Bibliography References to **Modern Years**

Make sure your References cover a broad cross-section of :-

- (i) Academic Journals
- (ii) Advanced Theory Text Books
- (iii) Tutorial Information
- (iv) www electronic-sites including **SCIRUS**

Make sure you Reference every Reference with its Reference origin.